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ARTHRITIS*

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My subject today is arthritis and within the limited time of fifteen minutes I want to give you as clear a concept of the disease arthritis, as I know it, in its various ramifications.

Two years ago I read a paper before this Association under the caption of Chronic Infectious Arthritis and presented an etiological classification of arthritis. The article was published in the Florida Medical Journal. A year later, the heads of the arthritic clinics met in New York and adopted a similar classification.

From an etiological viewpoint there are five important factors responsible for the various types of arthritis, viz: (1) bacterial infections, (2) metabolic dysfunction, (3) allergy or hypersensitiveness of the joint to bacterial allergens and to foreign sera, (4) trauma, (5) neuropathic disturbances. Each etiological factor is represented by a distinct type of arthritis but as a rule more than one of these factors play a part in causing each type of the disease. For instance, in the infectious group bacterial allergic reactions are important in producing the disease, while in the metabolic group allergy and infection play no part. Trauma, especially in the weight bearing joints, is a factor in both, but to a greater degree in the metabolic group. And while the changes in the joint in the neuropathic group, as Charcot's joint, are due primarily to the neurological lesion, the secondary factors are trauma and loss of tissue vitality and trophic metabolic dysfunction in the joint, and the pathological picture is similar to osteoarthritis.

Now, I want to give you a classification which I think will be very helpful in diagnosis and in directing rational therapy. The classification in detail is as follows:

*Read before the Sixty-first Annual Meeting of the Florida Medical Association, Jacksonville, April 30, May 1 and 2, 1934.

CLASSIFICATION OF ARTHRITIS

I. Infectious—	(A) Focal infections 1 streptococci and occasionally staphylococci	
	(A) Secondary infection 2 streptococci in lesion of hollow viscera draining into adjacent lymph glands	(1) Chronic infectious arthritis Syn- Rheumatoid arthritis Atrophic arthritis deformans Proliferative arthritis Still's disease in childhood
	(B) Specific organisms	(1) Gonorrheal arthritis (2) Syphilitic arthritis (3) Tuberculous arthritis (4) Arthritis caused by other specific organisms
	(C) Complicating sepsis, wounds	(1) Septic arthritis (specify organism)
	(D) Etiology unknown Protean clinical features Frequent heart disease leaving no joint deformity	(1) Rheumatic fever
II. Metabolic—	(A) Dysfunction (purine) (purine or carbohydrate) (metabolic decline in aging process)	(1) Gout (2) Osteoarthritis Syn- Hypertrophic arthritis deformans Degenerative arthritis
	(B) Deficiencies (vitamine) (vitamine and sunshine)	(1) Scurvy (2) Rickets
III. Allergic—	(A) Bacterial allergens	(1) Rheumatic fever (2) Poncet's tuberculous arthritis (3) Some infectious arthritides
	(B) Foreign sera	(1) Serum sickness

(Missing 3c & 4c)

IV. Traumatic—(A) Fractures into the joint
(B) Hemorrhage as in hemophilia
(C) Excessive wear and tear in deformed joints, joints of the aged.

V. Neuropathic—(A) Tabes (1) Charcot's joint
(B) Syringomyelia
(C) Hemiplegia
(D) Spina bifida

It is evident that it will take a course of lectures to go into detail regarding these various groups and subgroups of arthritis, so I am going to limit my remarks to chronic infectious arthritis of focal origin and to some phases of the metabolic group.

In chronic infectious arthritis of focal origin and due particularly to streptococcus hemolyticus, viridans and non-hemolyticus, and very occasionally to staphylococcus albus, the pathological changes begin in the synovial membrane as an allergic reaction in many instances, and in others by direct infection of the joint tissues. The synovial membrane frequently secretes an excess of fluid distending the joint capsule, sometimes to a marked degree. Fringes and villus formations appear and in time a pannus-like layer of granulation tissue extends from the synovial membrane over the articular surfaces causing softening, absorption and erosion of the joint cartilage. The perichondrium proliferates to a variable degree forming specialized connective tissue which may be converted into cartilage or bone. Frequently, the connective tissue of the epiphyseal bone marrow proliferates and granulation tissue extends upward from the subchondrial bone into the cartilage causing destruction and absorption of the cartilage. Thus, the joint cartilage is destroyed in two ways, viz: by the pannus-like growth of granulation tissue from the synovial membrane extending over the joint surface, and by the proliferation of granulation tissue arising in the epiphyseal marrow and extending up into the cartilage from below. Subluxation and luxation are likely to occur when the joint cartilage is destroyed. The endosteum of the epiphysis may also undergo a variable proliferation forming new bone cartilage along the epiphyseal line and true ankylosis may occur in this type of joint.

Now, we have at least one cause, focal infection, and the effect, the pathological change, face to face, and the problem is how can we prevent and how can we cure the disease? The answer is first, by finding and removing the focal infection, and at the same time growing in pure culture the offending organism for future vaccine therapy. This is imperative. Second, by supportive treatment—a treatment similar to the modern treatment of pulmonary tuberculosis, the special features receiving appropriate measures. Third, by desensitizing and immunizing the patient by intradermal injections of the autogenous vaccine over a long period of time. Fourth, by removing diseased tissue as the synovial membrane and the pannus of granulation tissue, which is an outgrowth of the synovial membrane. Fifth, by orthopedic measures as interposing fascia between the joint surfaces.

The problem is not as easy as it sounds for it requires a great deal of study, patience, skill and cooperation in order to get the desired results. And I want to state here that we have no specific drug which will cure the disease. Drugs, if used at all, should be for symptomatic relief.

The time element is all important. In early cases the results are most frequently good, but if treatment is instigated after the vulnerable part of the joint, the joint cartilage, is destroyed or burnt out, so to speak, the results are most often poor, excepting in those patients who in time acquire sufficient immunity to allow the orthopedic surgeon to come to the rescue with reparative measures which frequently restore the function of the joint in some degree.

The first step in treatment is to find and remove the primary focus of infection and grow in pure culture the offending organism and make the autogenous vaccine by proper methods for vaccine therapy. I want to emphasize here that these two procedures are not properly coordinated in most patients with arthritis. The removal of the primary focus is not easily done, the organism has spread to other tissues, particularly the lymph glands, and the disease goes on. Dental focal infection can be eradicated completely and the results are sometimes striking, relief prompt or within a few months. There are other patients who will not improve without the use of the autogenous vaccine over a prolonged period. I haven't much faith in the nonspecific therapy of arthritis, as, milk, stock vac-

cines, etc., excepting in gonorrhea where the organism is known and only after the primary disease in the urethra, prostate, tubes, etc., has been clinically cured. In general I may say that vaccine therapy is of no value in the treatment of acute infectious diseases and it holds true in arthritis.

Now, I want to divert your attention to the second great group of arthritides, the metabolic group, and take up first, gout, as a factor causing arthritis. We know the disease is due to dysfunction in the purine metabolism and the clinical symptoms may be controlled by a low purine diet, and colchicum during the acute attacks. Uric acid, which is an end product of nucleic acid metabolism, is deposited in the soft tissues causing an acute inflammatory reaction, and further, uric acid or the sodium salt is deposited in the joints of the extremities particularly, as a chalky layer over the cartilage causing absorption and erosion. Uric acid is also deposited in the cartilage and even in the bone. When the uric acid is absorbed the calcium salts are usually absorbed also, leaving punched-out areas on the joint margin and cystic-like areas in the medulla of the bone. The periosteum at the joint margin is converted into bone, thus completing the bony ringlet at the joint margin. The periosteum at the insertion of tendons may be converted into bone, producing bony prominences and spurs in these regions. Outspoken clinical gout is not such a frequent disease, nowadays, and I bring the subject up only to throw more light on the next disease, osteoarthritis.

In osteoarthritis the pathological process begins in the joint cartilage. There is vertical fibrillation, softening and erosion of the cartilagenous surface in areas of variable sizes and the perichondrum of the opposite cartilage proliferates and fills in the dead space or eroded area, thus keeping the joint surfaces in contact. This process goes on very slowly and at times even without symptoms, and there is also a gradual thinning of the joint cartilage. The joint line becomes very irregular from the erosions and perichondrial proliferations on opposite surfaces and motion may be very limited. In time the joint cartilage may be destroyed on both surfaces and the uncovered bone becomes very dense, even more dense than cortical bone in some instances. The two opposing surfaces of dense bone do not form a true bony ankylosis, although motion at times may be very limited due to the irregularities in the joint line and to bony deposits at the joint margins. There is lipping or mushrooming at the joint margins; cyst-like formations appear in the medulla of the subchondrial bone; the periosteum is converted into bone at the tendon insertions producing spurs and ridges so often seen in x-ray films. Quite extensive destruction of the cartilage may occur, however, before the x-ray film reveals what is taking place—thinning of the joint space being the only clue. Again, there is marked thinning of the joint space and marked lipping without symptoms, and the question naturally arises: What is the toxic substance causing the destruction and what is the activating agent?

Certainly, the pathological picture of osteoarthritis cannot be due to a degenerative process alone for it frequently begins in the thirties, if not before, its frequency increasing with age, and we know there is a gradual basal metabolic decline in proportion to increasing age. Neither can trauma be the activating agent for women who live in luxury and are never subjected to trauma have the disease. Studies in metabolism in these patients are throwing light upon the subject, as many of the osteoarthritic patients have an abnormal purine response or a low carbohydrate tolerance or both. Many are over-weight and some have a lowered basal metabolism. The most encouraging thing is that if these patients are taken in hand early and the proper metabolic corrections made the clinical course of the disease can be controlled. Those who have an abnormal purine response are put on a low purine diet, and those with a low carbohydrate tolerance are put on a sugar-free and low starch diet. The obese are reduced to normal weight and when the basal metabolic rate is below the normal standard for the age thyroid gland should be given in proper amounts. Thus, the clinical symptoms of the disease may be controlled in osteoarthritis but the bony lipping and spurs are permanent.

In conclusion, great headway has been made in the classification and the treatment of arthritis and I want to urge you as practitioners not to wait till the joint bearings are burnt out and recovery all but impossible. Have the patient investigated early and adopt the modern plan of therapy and the results will be gratifying.

DISCUSSION

Dr. W. McL. Shaw, Jacksonville:

I will not go into any classification of arthritis. Dr. Gammon has brought out the confusion that already exists in trying to classify it. But, from the roentgenologist's point of view the best way to present it is by an etiological classification. I wish to show a few films illustrating several of the types of which Dr. Gammon spoke.

We have four tissues involved in the formation of each joint, namely, synovial fluid, synovial membrane, cartilage and ligaments. Bone does not primarily enter into the formation of a joint. We have destruction or disease of one or more of these four structures in every arthritis.

FILMS:

I. *Metabolic Dysfunction:*

The first film is one of gout, representing metabolic dysfunction. In gout the characteristic findings are these punched-out or decalcified areas that appear as holes, as Dr. Gammon described.

This film also demonstrates another type of arthritis, an old gunshot wound of twenty years' standing with traumatic arthritis resulting in bone against bone without any cartilage.

The gouty joint has swollen periosteal structures, and cartilage thinned out. It is due to these periosteal changes in the bone that you get the characteristic punched-out walls back of the joint line.

Another film in this same group shows the so-called hypertrophic arthritis. Inflammation is particularly irregular with spur formation. You never get a bony ankylosis in arthritis of this nature. In this form the gastro-intestinal tract is particularly at fault. These are the cases greatly relieved at times with colonic irrigations.

II. *Neuropathic Arthritis:*

The next film is of the neuropathic type. Here is a Charcot joint of the elbow with complete destruction of the cartilage back into the bone and thickening of the adjacent bone. This lateral view shows complete joint destruction.

Another case of Charcot joint of the ankle: The patient walked in on this ankle. It was not painful, but rather noisy. You could hear it grate. There was complete destruction of the ankle joint structure, bone against bone, with a jagged saw-tooth effect that Dr. Gammon described as "jig-saw puzzle" effect. There is a peculiar loss of pain in these Charcot joints.

III. *Bacterial Infections:*

One of the largest groups of arthritis we have to deal with is bacterial infections. This film is an old gonococcus arthritis from gonorrhea of sixteen years' standing. The point I wish to demonstrate is that the joint has just been rubbed out on the film as in icing on a cake. You get the effect of a thin layer of bone spread over the joint. The sacro-iliacs are obliterated. This condition runs up to the cervical area in this case.

This film shows an acute gonorrheal infection of the elbow. Here we get "a burning out" of the bearings, as has been expressed. This is the acute stage. The articular surfaces are going and the bone is getting ready to throw out new bone and close the entire joint.

Another of the larger groups we have to deal with outside of the gonococcus infections, is general bacterial infection. This film is of a streptococcic joint which presents practically the same picture with a jagged saw-tooth effect. The cartilage is "burned out" and clusters of spur formations form in the joint.

The next film shows a staphylococcic joint. This is an osteomyelitis including the os calcis, the ankle joint and the lower end of the tibia. This is another film of the same joint with lipiodol injection showing a sinus tract leading entirely through the joint with destruction of all articular surfaces and resulting osteomyelitis of the tibia and fibula. This is practically the same picture as streptococcic osteomyelitis with fixation of the joint and marked atrophy in the tarsal bones.

IV. *Traumatic Arthritis:*

The traumatic arthritides I will not show. We get them in workmen who stand all day on a hard cement floor with constant injury to the knee joint. There are no characteristic x-ray changes.

V. *Allergic Joints:*

Allergies I am not going to show because the x-ray does not show any joint change in these allergic conditions. Such joints will look practically normal on the illuminator. We find them frequently following administration of horse serum, etc.

Dr. Clayton E. Royce, Jacksonville:

I think it is quite apparent to any one who has done only casual and but little reading on the

subject of arthritis that there are many varied concepts of the disease, that there are many varied results while using the same technique in the study and treatment of the disease.

Nevertheless, I feel that in the paper which Dr. Gammon has presented this morning, he has given you a comprehensive survey of the entire subject. He has covered every particular point that there is to be covered in a general way. My discussion of the paper will be limited to personal experiences with studying the bacteriology of this joint condition.

I also want to emphasize particularly some things which Dr. Gammon did not bring out in his paper for lack of time. One of them he touched on first of all, and that is never to have a focus of infection removed without first making preparations to have a culture made from that focus of infection. Because many cases have gone on into a long-continued chronic stage when that might have been prevented by the benefits of vaccine procured from a culture made when the primary focus was removed. After the primary focus is removed, that much is lost. Time is lost, and perhaps the entire opportunity is lost. Making these cultures is not as simple a matter as it might sound to be. It is simple enough to get everything ready in the first place, but it requires very close cooperation between the man who is going to remove the focus, the technician and the bacteriologist. The bacteriologist must be there when the focus is removed with culture media ready to receive the material directly from the man who has removed it. Whether teeth or tonsils or whatever it may be, it needs to go at once into the proper culture media. And the culture media should be previously warmed to body temperature so that there is no opportunity for a change in temperature to affect these organisms. The organisms which produce chronic arthritis are sensitive organisms, especially susceptible to sudden changes. Many of these, especially those about the roots of the teeth, are accustomed to living with low oxygen pressure and it is necessary to provide a media which will take care of that. Get it into culture directly and results should follow.

Sometimes people ask, how do you know that you have a streptococcus that is making the trouble, from the teeth for instance? The answer is: If you get some of the streptococci from the mouth that will grow on any kind of culture media, or if you get the one making the trouble that grows slowly at first or won't grow at all in ordinary culture media until placed in culture media which is especially adapted to it.

The method of Dr. Meyer Solis-Cohen of Philadelphia is very useful, particularly when culture is made from diseased tonsils. He puts a little septic material into a dry culture tube and adds a few cubic cm. of blood from the patient's vein to this material. You would very often be surprised at the results that follow. As a rule in the patient's blood only one kind will grow out and that is presumed to be the kind against which the patient has no defense.

We have come to the belief in working on these cases that the organism is type specific. That is, you must use vaccine made from the organism from the patient. Excepting in cases of gonococcus, stock vaccine has not proved of value.

That is not the experience of every one who has worked on the tests, but as I say we can only report what we have found out.

Dr. Julian E. Gammon, Jacksonville (concluding):

The subject arthritis is a large one. A classification has been presented and some phases of the subject discussed.

I want to emphasize one thing further about the infectious group of arthritis and that is: we have no specific drug that will cure the disease, neither have we a specific antitoxin. We must find the focus of infection, do our utmost to remove it, although the difficulties are great at times; make autogenous vaccines for future desensitization and immunity. We must support the patient with adequate measures during the course of immunization and finally in some selected cases remove diseased tissue and apply other orthopedic measures when indicated.

The second great group of arthritis, called osteoarthritis or hypertrophic arthritis deformans, is not due to infection. The disease begins in the cartilage and is most frequently due to a metabolic disturbance. Its frequency increases with the aging process, which shows a gradual metabolic decline. Some forms of this type of arthritis are due to trauma.

And so, we have the two great groups of arthritis due to entirely different etiological processes, the one beginning in the synovial membranes and the other in the cartilage.

QUININE AND MALARIA*

PAUL EATON, M.D.,
Jacksonville.

Although it has been known for a long time that quinine is a specific for malaria, there is no substantial agreement as to how it acts. Malaria plasmodia will swim about gay and unharmed in concentrations of quinine far greater than can ever be obtained in the blood in practice. Stimulation of phagocytosis is alleged by some to be the modus operandi. The best explanation offered so far is that the animal body is able to elaborate out of quinine, a substance harmless to itself, yet toxic for the parasite. This is equivalent to saying that the drug cures the disease.

As far as I can determine, published reports of experimental work along this line are limited to statements that malaria plasmodia, known to have been in the patient's blood, were, or were not, discoverable in the blood after the administration of such and such amounts of such and such salts of quinine.

In this paper I desire to present a method of study rather than any important results.

The method I propose is based on the fact that the age-group characteristics of any population constitute a very important source of information as to the state or condition of said population. It is universally acknowledged that this is true with respect to human populations. Damren and I showed that this feature could be profitably used in determining the life duration of the red cell. I now propose to apply the same idea to the study of the parasite population in the blood in cases of malaria.

It is, of course, impossible to tell the age of a malaria parasite to the hour, merely by looking at it; but with the knowledge we have it is quite possible to make a rough classification of P. vivax for example into twelve hour age groups, and if a sufficient number be dealt with,we will be justified in believing that errors will balance each other. By this I mean that for every ten or eleven hour old parasite that is erroneously assigned to the second twelve hour period, a thirteen or fourteen hour old parasite will be mistakenly put into the first twelve hour group. This will not be strictly true of course until very large numbers have been dealt with under a very fine technique, but it will be near enough to the truth to give us valuable information.

The application of this method requires careful study of the cases involved and accurate timing of the intervals at which specimens are taken. It may be better understood by considering an example.

N. M., 36, white, mail clerk, who had been showing symptoms of tabes for some time, was infected with P. vivax by the bites of two mosquitoes which immediate dissection showed to have been infected. In the hospital he was allowed to have 18 chills, his temperature crests running from 105.6°F. to 107.0°F. Two hours after the 17th chill a set of blood films was made and quinine was ordered at the rate of 5 grains t.i.d. Twenty-four hours later, immediately after the 18th or last chill, and after the patient had received 15 grains of quinine, another set of films

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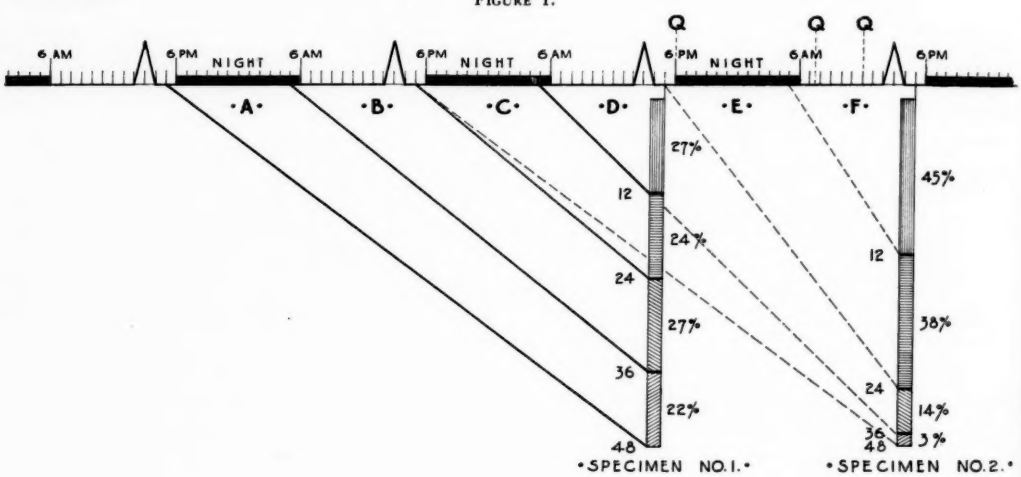
FIGURE 1.



was made. It is to the difference between the parasite populations in these two sets of preparations, that I wish to direct your attention.

Figure 1 shows diagrammatically the relation of the time of taking the blood to the temperature and to the medication.

Since P. vivax lives 48 hours it will be seen that on preparation number 1, there will be parasites referable to period A, B, C, and D. We are interested in the respective numbers or proportions of these. Careful counting revealed the following age-groupings:

TABLE I

Age	%
36-48	3
24-36	27
12-24	24
0-12	27

This table shows first of all that there was in this case a smaller degree of concentration of sporulation at the chill time than the popular belief would lead us to look for. Since the chill was quotidian it is to be expected that the peaks at D and B would be about the same height. There had been a higher mortality among the parasites referable to period A. Ordinary wear and tear and the activities of the white cells might be held to account for this although I do not see just why there should be a difference between A and C and none between B and D.

When we come to consider the preparations made after 15 grains of quinine had been administered we find a totally different picture as in Table II.

TABLE II.

Age	%
36-48	3
24-36	14
12-24	38
0-12	45

This corroborates the finding in preparation number 1 to the effect that there is less concentration of sporulation at chill time than might be expected on the basis of current teachings. But the most important thing is the relative scarcity of parasites more than 24 hours old.

Let it be noted that these findings are purely relative. That is to say, we have no means of knowing from this work how many parasites had been killed. All we do know is that the survivors are distributed into age groups in a way very different from the way in which the original population had been distributed the day before.

These findings need confirmation, but they seem to show that the action of quinine is on the parasites of greatest age.

For help in the tedious task of counting and classifying between five and ten thousand parasitized cells, I wish to express my thanks to Miss Pearl Griffith, Mrs. Janet Bell, Miss Catherine Underwood and Miss Elnor Marr, members of the technical staff of the Jacksonville Laboratory.

DISCUSSION

Dr. Clayton E. Royce, Jacksonville:

In this discussion of Dr. Eaton's I seem to see the opening of the door which will at last put the use of quinine on a scientific basis rather than empirical. In other words I think that if he follows up the work which he has undertaken he will be able to show us just what it is that quinine does to the malarial parasite.

There is a significance in the second group of figures. With only 3% of survivors of the 48 age group, the parasites have been killed off just before sporulation, and for every one of these that is killed off we have avoided the pumping into the blood stream of from twelve to twenty-four new-born parasites—and that little point alone indicates something about the amount of quinine that it is necessary to use.

I happen to know that Dr. Eaton has already made some very successful observations on the age of the red blood cell which is invaded by the parasite, and I am going to take this opportunity to ask Dr. Eaton if he is willing to touch on that phase of the work with regard to the work he has shown us here.

Dr. G. H. Edwards, Orlando:

I would like to ask Dr. Eaton if he gives quinine in the form of pills or solution.

I have for many years given my quinine in solution using a few drops of aromatic sulphuric acid to dissolve it. I have found that most of the pills on the market go through the gastro intestinal tract as pills. Even the famous friable variety is not exempt and many of the tablets which are on the market are also seemingly inert, possibly because, due to illness, a patient is not secreting sufficient hydrochloric acid.

Dr. Paul Eaton, Jacksonville (concluding):

In this case the quinine was given in capsules. I am just as convinced as the questioner that the only way to give quinine is in solution.

PARA-NASAL SINUSITIS*

CORNELIUS G. COAKLEY, M.D.,
New York.

The most common complication of a cold in the head is the infection of some or all of the para-nasal sinuses. These sinuses comprise the two maxillary sinuses, the two groups of ethmoid cells, one on either side, which groups are subdivided into the anterior group and the posterior group of ethmoid cells; the two frontal sinuses and the two sphenoidal sinuses. With the exception of the sphenoidal sinuses the origin and development of them come from cells in the ethmoid labyrinth as a prolongation of these cells into the superior maxillary bone on the one hand, and into the frontal bone on the other. The sphenoidal sinus is not developed from the ethmoid labyrinth, but from a projection back from the posterior portion of the septum. A sphenoidal sinus is not developed before birth and may be present as a pretty good sized cavity during the first few years of life.

It is important to note that by the time a child is born this hollowing out of the superior maxillary bone has already begun, so that the cavity of the maxillary sinus is about the size of a medium-sized pea, but situated high up underneath the orbit. The growth of this cavity is very rapid, and by the time the child reaches the 12th year, it has attained its full development. At birth there are well-defined anterior and posterior ethmoid cells, very small, but still present. On the other hand there is no evidence whatever of an extension up into the frontal region, therefore no frontal sinuses, and these usually do not appear until somewhere about the fifth year of life. This order of development should be borne in mind because young children very frequently have infections of the para-nasal sinuses, and up to the fourth or fifth year when an infection takes place, it consists only of an involvement of the maxillary, ethmoid or sphenoidal sinuses. There is not usually very much difference in the size or capacity of the two maxillary sinuses. There is, however, a very great difference in the size of the ethmoid cells, both the anterior and the posterior group. I have never seen a case where there was an absence of either maxillary sinus or an absence of the ethmoid cells. On the other hand there is an enormous difference in the size and shape of the frontal sinuses. They may both be equal in size but this is rather unusual; one or both of the frontal sinuses may be absent. I think we may account for the nearly uniform development of the maxillary sinuses from the fact that the off-shoot from the ethmoid labyrinth which extends into the superior maxillary bone takes place before the birth of the child, and the growth of this off-shoot is not greatly inhibited by any inflammation of the mucous membrane occurring during the child's life. On the other hand inflammation of the ethmoid cells during infancy interferes with the proper development of the ethmoid labyrinth so that in some patients we may have ethmoid cells that are pretty good sized, and in other cases ethmoid cells that are thick walled and rudimentary in their capacity. It also probably accounts for the fact that there is such great difference in the size, shape and capacity of the frontal sinuses.

If a child has frequent colds during the first three or four years of his life the normal progress of the ethmo-frontal off-shoot is interfered with. It may be complete inhibition in which case there will be no frontal sinus on one or both sides, or it may be inhibition more on one side than the other, thus accounting for the difference in the size of the two frontal sinuses. This inflammatory condition in the ethmoids, limiting the development of the ethmoid cells and the frontal sinus is quite analogous to what takes place in the mastoids. Children with repeated attacks of acute suppurative otitis media, accompanied by some mastoiditis, will be found to have small celled, sclerotic mastoids, whereas those who do not have these acute attacks of ear trouble develop large cells, so-called pneumatic mastoids.

The para-nasal sinuses are lined with a thin layer of mucous membrane not over a twenty-fifth of an inch in thickness. In this mucous membrane there are mucus secreting cells and some serous secreting cells. The epithelial lining is of the columnar ciliated variety. These cilia move particles in a direction towards the normal orifice of the sinus, thus for the maxillary sinus to the middle meatus. In the case of ethmoid cells the anterior group opens in to the middle meatus and the posterior group opens into the superior meatus.

In the case of the frontal sinus the cilia direct the secretion downwards through the naso-frontal canal also into the middle meatus. Normally there is no secretion whatsoever in any of these sinuses, and as we have seen, the sinuses are

*Lecture delivered at First Post-Graduate Medical Course, Gainesville, June 19-24, 1933.

normally free from any bacterial content. It must not be forgotten that the mucous membrane of each of these sinuses is actually a continuation of the mucous membrane of that part of the nose in which the sinus opens, although the structure of the mucous membrane of the sinuses is somewhat different than that of the mucous membrane of the nose proper.

Pathology: Whenever there is an acute inflammation of the nasal mucous membrane, its extension into the para-nasal sinuses must be expected. The extent of this sinus inflammation will depend upon the severity of the inflammation of the nasal mucous membrane, and also upon the effect that the several pathogenic organisms or their toxins may have upon this membrane. During the early stages there is a simple congestion of the mucous membrane and the increased vascularity results in the outpouring at first of a small amount of thin watery albumin containing fluid. If the inflammation becomes more severe in addition to the serum we have an increased activity of the mucus secreting cells so that there is a thick mucoid secretion within the cavity, and a little later in the process, we have a desquamation of cells and the production of a certain amount of pus cells, so that the secretion becomes mucopurulent, but remaining thick and tenacious. With the advent of putrefactive organisms, especially when the antral involvement is the result of an apical abscess around the teeth, the secretion becomes liquified and has a foul odor. It is rarely, however, that in acute cases, not due to tooth infection, that there is any odor or liquifaction in the secretion within the sinuses. When the secretion is thin and purulent it is presumptive evidence that the patient has had the infection several days or it is an acute exacerbation of a chronic inflammatory process within the sinus. During the height of the inflammatory process the mucous membrane of the antra becomes enormously thickened, so that instead of being about 1/25th of an inch in thickness as it is normally, it may be so edematous and swollen as to nearly fill the entire cavity of the sinus. Such an enormous swelling of the mucous membrane blocks up the outlet of the sinus so that the cilia cannot easily remove this secretion, as the openings are no longer patent, and consequently the secretion is retained under pressure and most of it gets out only when the pressure is sufficient to overcome the obstruction at the orifice. It is such cases as these that have pain accompanying the infection. With the subsidence of the inflammation, the swelling of the mucous membrane recedes, leaving little or no thickening of the mucous membrane. However, it is our opinion that frequent attacks of infection of the sinuses result in a chronic thickening of the mucous membrane which may often be detected in our examination either by transillumination or by an x-ray of the sinuses.

Infection of the Para-Nasal Sinuses: Infection of the para-nasal sinuses is, I believe, very much more common than is usually thought. I believe that every cold in the head accompanied by such an amount of swelling of the nasal mucous membrane as to block up the nose and produce mouth breathing is accompanied by more or less involvement of the para-nasal sinuses but especially of the maxillary and ethmoid sinuses. For some reason the frontal sinuses and the sphenoids are less prone to infection.

Symptoms produced by infection of the para-nasal sinuses are two:

First: Discharge.

Second: A feeling of fullness in the head, or a distinct or throbbing pain referred to some portion of the head.

In the early stages the secretion like that from the nasal mucous membrane is mainly serous. In two or three days there is a thick, only slightly turbid mucoid secretion, to be followed in another two or three days by a secretion that is still thick and yellowish or slightly greenish in color, according to the color producing bacteria that are present. The pain in para-nasal sinus infections is, as was previously described, due to secretion retained within the sinus under pressure. No matter how much discharge there may be, if the normal openings of the various sinuses are sufficiently patent to allow the secretion to be eliminated as fast as it is formed, the patient will have no pain. One of the fallacious popular impressions is that acute sinusitis is accompanied by pain. Very frequently when I am examining a patient and diagnose an acute sinusitis the patient will remark, "Why, doctor, I have not had any pain." There seems to be an idea on the part of the medical profession that if they press over the cheek in the region of the antra, and it does not prove painful, they can rule out maxillary sinus involvement. This is a great fallacy as pain on pressure over the maxillary sinus would depend upon whether the secretion within the sinus were under pressure or not. The most common com-

plaint of a patient, who has pain in an acute sinus infection, is headache referred to the frontal region. This is true whether the maxillary, ethmoid or frontal cavities are involved. It is due to the fact that these three sinuses are innervated by the fifth cranial nerve. The maxillary sinus is innervated by the infra-orbital branch of the fifth and the pain is referred to the supra-orbital branch in the region of the forehead. It is easy to differentiate between the referred pain and the actual involvement of the frontal sinuses by pressing on the under portion of the frontal bone just internal to the supra-orbital notch. If the frontal sinus is involved, this region will be found to be exquisitely tender; also percussion over the anterior surface of the frontal bone will be painful. If these regions are not tender one should look for the cause of the pain as of either maxillary or ethmoid origin. One great peculiarity of sinus pain is the fact that it often begins about 9 or 10 a. m., becomes very severe an hour or two later and entirely disappears during the early afternoon. I have thought that the cause of this was the fact that during rest at night there was less blood supplied to the inflamed mucous membrane, consequently less secretion, but with the daily activities and increased heart action the swelling and the secretion increase with partial or complete blocking of the outlet resulting in pain. When the accumulated secretion is under sufficient pressure to be evacuated the relief of pressure and consequently the relief of pain occur. Periodic frontal neuralgia and headaches were formerly regarded as malarial in origin but now require thorough and careful examination of the para-nasal sinuses as a possible cause. The pain due to involvement of the sphenoidal sinuses is usually referred to the occipital region or to the ear.

To Diagnose Para-Nasal Sinusitis: The diagnosis of para-nasal sinus infection is rather difficult for the general practitioner to make unless he has had some training in rhinology. To the specialist, however, the diagnosis of these acute cases is usually not at all difficult, provided a systematic routine examination is carried out. The following routine is recommended:

First: Inspection of the nares will show a swollen, red, mucous membrane, almost if not completely blocking up the nasal passages. Some secretion may be found in the nose along the floor which has dropped down there from either the maxillary, ethmoid or frontal sinus, or from the nasal mucous membrane itself. The post-nasal examination will show a reddened, swollen posterior end of the inferior and middle turbinate and some secretion in the naso-pharynx.

Second: The nasal mucous membrane should be contracted with a weak 2% solution of cocaine, or 1/10,000 adrenalin, or an ephedrin solution. If the nasal mucous membrane is considerably swollen, a second application of these solutions may be necessary to sufficiently contract the nasal mucous membrane to enable one to make a proper and adequate inspection of the anterior part of the nose.

Third: While waiting for the solution to act, transilluminate the sinuses. The value of transillumination depends upon the examiner's experience in transillumination, and upon the anatomical arrangement, especially in the case of frontal sinuses. If one maxillary sinus illuminates less brilliantly than the opposite one, it is certain that there is something to account for the loss of illumination on the darker side. As the maxillary sinuses do not vary so much in size, it would be presumptive evidence that there is an involvement of the darker antrum. If both maxillary sinuses are infected, both will be darker than normal, and it is then that one's experience as a result of many transilluminations comes into play in interpreting the lack of illumination. One never gets as good an illumination in the thick-boned, heavy-jawed and fat individual as in the thinner boned, less adipose individual. Transillumination of the frontal sinuses is less reliable than that of the maxillary sinuses because of the frequent absence of or difference in the size of the two frontal sinuses.

Fourth: The fourth step is the removal, by swab or a suction apparatus, of the loose secretion along the floor of the nose.

Fifth: Inspection of the nose from within by the naso-pharyngoscope. This instrument should be passed along the floor of the nose through the nasal cavity until it touches the posterior pharyngeal wall, the prism being held in a vertical manner. One can thus view the posterior ends of the middle and inferior turbinates. On infection of the maxillary sinuses, one will almost invariably see a streak of thick, whitish or yellowish secretion in the angle between the upper and outer portion of the inferior turbinate, and the lateral wall of the nose. Such a secretion in this neighborhood indicates very clearly that it has come from either the maxillary, frontal or anterior

group of ethmoid cells. One may see a similar secretion between the middle turbinate and the septum, which secretion must come either from the posterior group of ethmoid cells or the sphenoidal sinus. Having inspected the posterior region of the nose the naso-pharyngoscope is brought forward and passed up into the middle meatus. Unless there is an enormous swelling of the mucous membrane of the lower border of the middle turbinate, one can often see secretion coming directly from the normal maxillary orifice.

Sixth: It is always possible that at the time of examination no secretion may be flowing from any of the sinuses, and therefore negative findings will be obtained by the preceding examinations but if the transillumination and the patient's other symptoms indicate an involvement of the sinuses, then a good x-ray of the sinuses should be ordered. These if properly taken and at the proper angles, will almost never fail to show the place and probable extent of the lesion.

I desire to urge rhinologists to learn to read their own plates, and not to rely entirely upon the opinion of the radiographer's interpretation of the plates. The radiographer has only the plates before him for his report, whereas the clinician has the plates, the patient's history and his subjective findings to aid him in forming his diagnosis.

Poor plates or plates taken at an improper angle are usually worthless as an aid to diagnosis.

Treatment: Very many cases of acute paranasal sinus infection are completely recovered from, along with the subsidence of the acute symptoms in the nose, without any treatment. A familiar example to many of you will be that during the later stages of a cold in the head and while we are blowing out a moderate amount of thick muco-pus,—suddenly on one day we will blow out from one or the other naris, an enormous quantity of secretion, with a general feeling of relief from fullness in the head. From that time on there is a rapid lessening in the amount of secretion we are blowing out. All patients with a sense of fullness in the head during an acute cold should be considered as having a sinus infection. The symptoms as well as the discharge is lessened by affording facilities for drainage from the sinuses. This can only be done when the outlets of these sinuses are not blocked up by swollen nasal mucous membrane. Therefore, three or four times a day if the nasal mucous membrane is kept contracted by the use of a spray of adrenalin or ephedrin, it will be found to facilitate drainage from the sinuses. In the stage where the secretion is thick and tenacious, I have found great relief by nasal irrigation with normal saline solution after contracting the nasal mucous membrane. It will usually be found that one nostril is more free than the other, and if one irrigates through the more obstructed side so that the irrigation may return through the freer side there is practically no danger of forcing any of the irrigation fluid mixed with the infected nasal secretion into the eustachian tube and induce an acute otitis media. I believe that such an irrigation helps to drag out the thick tenacious mucus that is protruding from the sinus so that oftentimes it will bring away every bit of secretion within the sinus. If contraction of the nasal mucous membrane and nasal irrigation do not give relief from the head pressure or pain, then it is necessary to relieve the sinus by washing it out. This can very readily be done in the case of the maxillary sinuses by cocainizing the naso-antral wall beneath the inferior turbinate with a 10% solution of cocaine. If 30 minutes is allowed for the anesthesia to fully act the naso-antral wall can be punctured, and the antrum washed out with practically no pain. It is usually more difficult to enter the frontal sinus owing to the swollen anterior end of the middle turbinate, and to the fact that the naso-frontal canal is smaller and often tortuous, making it difficult to get a canula into the sinus. If, however, the pain is sufficient, and there begins to be an edema over the upper eye-lid, more radical measures must be taken at once. After cocainizing the middle turbinate and the outer wall beneath it and the middle turbinate, excise the anterior third of the middle turbinate and with forceps cut away the anterior group of ethmoid cells which obstruct the naso-frontal duct. After this has been done the frontal sinus may be readily entered and irrigated.

The sphenoidal sinus can usually be entered with a probe and afterwards with a canula, its contents washed out.

How often a maxillary sinus, a frontal sinus or a sphenoid sinus may require to be irrigated depends upon the degree of infection. Daily irrigation for a period of from one to three or four weeks in the very severe cases may be necessary. I believe that these irrigations should be done daily rather than at less frequent intervals

as is the habit of some. In a certain number of cases of para-nasal sinus infections that have not become chronic, and whenever on irrigating a maxillary sinus the discharge that returns is of a thin milky character, I am convinced that we have to do either with a long-standing involvement of that sinus or an acute exacerbation of a chronic sinus.

Chronic Sinus Infections: Chronic para-nasal sinus infections are very much more common than is generally supposed. The symptoms are mainly those of discharge, or as the patient calls it, catarrh. Frequent use of the handkerchief or continual hawking back and expectorating a post-nasal secretion, is a common symptom. Pain is rarely an accompaniment of chronic sinusitis, and catarrh or discharge the sole symptom.

The routine examination for a case of suspected chronic sinusitis is the same as that for acute cases above described. Many cases of chronic sinusitis may be cured by simple washing out of the sinuses as was indicated in the acute cases, but if after continuing to irrigate daily for three or four weeks no apparent progress is made, it will be found necessary to adopt more active and radical surgery. Much can be done for these patients by intra-nasal surgery. In the case of the maxillary sinusitis, under local anesthesia, amputation of the anterior end of the inferior turbinate and removal of an area of the naso-antral wall beneath the inferior turbinate for two centimeters antero-posteriorly, and a centimeter or a centimeter and one-half vertically will usually permit of such drainage and ventilation from the maxillary sinus as to result in a cure. All of these patients however have a mucous membrane which is susceptible to recurring inflammation during acute head colds, and they will necessarily require some attention during these head colds. Most of the patients, however, may be taught to use a canula and irrigate their own maxillary sinus so as not to require attention from their physician. In chronic frontal sinusitis great relief and a fair proportion of cures may be obtained by amputating the anterior third of the middle turbinal and curetting away the anterior group of ethmoid cells so as to shorten and greatly enlarge the naso-frontal canal and make it easy for the physician to wash out the frontal sinus. I have a number of patients who are perfectly able to irrigate their frontal sinuses just as they do their maxillary sinuses during exacerbations of their trouble. There are, however, cases of arthritis, cardiac disease and other forms of systemic infection where nothing short of complete removal of the chronically infected mucous membrane lining the sinus would give any hope of relief. In such cases the Caldwell-Luc operation for the maxillary sinus and the Killian operation for the frontal sinus, ethmoid and sphenoid, are the best procedures likely to give the required benefit.

Sinusitis in Children: The frequency with which children have an infection of their sinuses is as great if not greater than is the case with adults. Up to the age of six years they may develop maxillary, ethmoid, and sphenoid infections. At an older age the frontal sinus infections begin. Owing to the small size of their nasal passages and the highly vascular turbinal bodies very moderate attacks of acute rhinitis serve to completely block the nasal passage thus readily blocking the ostia of their sinuses. The presence of adenoids and hypertrophied tonsils also adds to the insufficiency of nasal respiration. Operations for the removal of tonsils and adenoids will frequently result in lessening the attacks of cold in the head and sinus infections, but we sometimes find patients who continue to have colds, running noses and mouth-breathing, after such operations. It has been my observation that these children almost invariably have a chronic sinus infection. They also are prone to re-hypertrophy of the adenoid tissue owing to the fact that this tissue is not only continuously bathed in the bacteria laden secretion from the sinuses, but because the toxins of these bacteria are absorbed by the lymphatics of the nose and sinuses and carried back to the lymphoid tissue at the vault and lateral wall of the naso-pharynx. As an evidence of the latter we often see a thick ridge of lymphoid tissue on the postero lateral wall of the pharynx behind the posterior pillar of the fauces. The diagnosis of sinus disease in children is more difficult than in adults, and often can only be suspected after a good x-ray of the sinuses is had. Children with colds in the head should be regarded as probable sinus victims and treated with ephedrin or adrenalin sprays to keep the nasal mucosa contracted so that the shallow sinus openings do not become obstructed, then the maxillary sinus may be irrigated either under local or general anesthesia as is done with adults.

ANGINA PECTORIS*

Report of a Case Relieved by X-Radiation

Joseph H. Lucinian, M.D.,
Miami.

Angina pectoris is a disease limited almost entirely to business and professional men and occurs more frequently after the fourth decade. The exciting causes are muscular effort, mental emotion and distention of the stomach after a heavy meal. In a major attack, the patient is seized suddenly with an agonizing pain and a sense of constriction in the region of the heart. The pain usually radiates to the neck and down the arm. The patient turns pale and cold sweat breaks out over the surface of his face. The duration of the attack is brief and lasts but a moment or two but in that brief period, the patient goes through the sensation of dissolution and a horror of eminent death. Should he survive the attack he feels weak and exhausted for a day or two. The fatal outcome is not dependent on the severity of the pain; the patient may survive repeated major attacks but succumb to a minor one. Less commonly, the patient presents all of the characteristics of an anginal attack but the pain is referred to the hypochondrium instead of to the neck and arms.

Angina pectoris is not a pathological entity but a symptom complex in which no constant lesions are found at autopsy. In a large series of cases, over one-third show no anatomic changes in the heart, aorta or the coronaries. The most frequent finding is aortitis of syphilitic or rheumatic origin. Arteriosclerosis is observed in a smaller percentage; but many angina pectoris cases terminating fatally do not present distinct pathologic lesions. It is also true that equally as large a group may reveal aortitis or sclerosis who have not suffered anginal attacks in life. Clinically we find very little, if any, deviation from the normal in the force, rhythm or frequency of the pulse. Dyspnea and fever are absent. The blood pressure is not always elevated. In the uncomplicated cases, electro-cardiographic tracings are negative.

The medical treatment of angina pectoris is palliative but often ineffective. During the attack, nitro-glycerine and amyl nitrite will promptly relieve the spasm. Chloroform may be given without risk. Morphia is more effective in true angina pectoris than in angina due to coronary thrombosis. In addition, the patient should lead a quiet life, avoid anxiety and worry, eat a simple diet and regulate his bowel movements. The surgical treatment, originated by Jonnesco in 1916, is more risky but has proved successful in expert hands. Likewise, the injection of alcohol into the stellate ganglion offers relief for a variable period of time but is inconvenient and uncertain. Obviously, roentgen treatment is free from all these objections if it could bring about relief in an appreciable percentage of cases.

Relief of pain in angina pectoris by the roentgen rays is based on their analgesic property which was one of the earliest observations in their clinical application. As pointed out by Dr. Holmes, relief from pain following irradiation, is too prompt to be dependent mainly on the reduction of a tumor and in the case of metastatic carcinoma, the dose is often too small to cause any shrinkage of the tumor. Favorable results are reported in the relief of pain in thromboangiitis obliterans by roentgen irradiation over the lower spine in lower extremity affections and over the upper spine in upper extremity affections. Relief of hyperesthesia, trophic and circulatory disturbances, are recorded in poliomyelitis. In Raynaud's disease, decrease in the irritability of the autonomic nervous system is brought about by paravertebral roentgen irradiation. The list could be extended indefinitely. Suffice to mention the almost complete relief of pain in such conditions as acute mastoid and sinus affections, erysipelas, neuralgias, pruritis ani, arthritis, etc. Desjardins believes that nerve cells, which of all the cells of the body are the most resistant to irradiation so far as functional or organic damage is concerned, are acted on in a specific manner and their irritability diminished by irradiaton. There can be no doubt that roentgen rays possess a definite analgesic property. The pain in angina is referred to the cutaneous distribution of the first, second, third and fourth dorsal nerves or in angina of the hypochondrium, from the fifth to the ninth dorsal nerves. Ransom claims that pain travels along non-myelinated fibers.

In hyperthyroidism, cutting off of the sympathetic ganglion on one side, diminishes the secretion of the thyroid on the same side and roentgen radiation has the same effect. In angina pectoris, we are apparently dealing with an abnormal func-

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tioning of the sympathetic and parasympathetic systems in which an imbalance exists in their inhibitory and excitatory impulses.

Nemours and Barrieu, who regard angina pectoris as a crisis of the cardio aortic plexus, in 1929 irradiated the upper segments of all the sympathetic system in a series of fifty-four cases, all grave and chronic. In thirty-one there was complete relief of pain; in eight, partial relief; in five, no relief and one was aggravated. The remainder were unaccounted for. In this country favorable results by roentgen radiation were reported by Ecker in one case in 1924 and by Samuel and Bowie in nineteen cases in 1928. The latter do not specify the number who obtained complete relief. Sussman working under the supervision of Dr. Holmes in 1930, reports the result of sixteen cases treated at the Massachusetts General Hospital, none of which had responded to medical treatment. Ten showed definite improvement, of which six were completely relieved. The treatments were applied to the upper dorsal sympathetic ganglia on the theory that the process is probably a blocking of the pain impulse, similar in nature to injection of alcohol into the stellate ganglion. In one case, the pain was referred to the hypochondriac region and was relieved by irradiating the lower dorsal ganglia.

Case Report: The case I wish to report is that of a white, married, business man, 51 years of age, and whose past history presents nothing relevant to his present illness. Three years ago the patient developed an insatiable thirst and polyuria, which was diagnosed diabetes mellitus. Modified diet has controlled his symptoms to date. During the past year, the patient has been easily fatigued and dyspneic on walking. Eight months before consulting me he had a severe case of sciatica on the left side, necessitating rest in bed for four weeks. Seven months ago he had his first real attack of angina in the region of the heart. The pain was stabbing in character, radiating to the left arm and leaving him much fatigued and alarmed. He consulted a physician who warned him of future attacks and advised him against active, mental or physical exertions. Aside from the frequent minor attacks the patient has had four or five severe attacks, chiefly on retiring or following a hearty meal. He was unable to walk more than two or three blocks or climb stairs without experiencing pain in the region of the heart. Physical examination by his family physician revealed no abnormalities of the heart or in the electrocardiographic tracings. His blood pressure has varied from 160 systolic and 95 diastolic in July, 1933, to 145/85 in December, 1933. He gives no luetic history and the Wassermann test is negative. He indulges in alcoholic drinks occasionally and in coffee and tobacco not at all. When first consulted, I found the patient a well-developed and well-nourished man, about 51 years old, six feet in height and weighing 170 pounds. The heart sounds were normal, pulse rate 76 per minute, blood pressure 135/80. There was no evidence of cardiac hypertrophy or arteriosclerosis and no swelling of the ankles. The heart measurements by teleoroentgenogram were within the normal limits.

Treatment commenced on February 13, 1934, to the upper dorsal spine with the following factors: Area 12 cm. diameter, focal skin distance 50 cm., .5 mm. cu. and 1 mm. Al filter, 200 KV, 4 MA, 150 r units, measured in air, backscattering not included. A total of three treatments were applied to the same area ten days apart, delivering a total of 450 r or ½ skin erythema dose. During the two months he was under my care, the patient had several mild attacks of discomfort in his chest, chiefly on retiring or after a heavy meal but not at all of the severity previously experienced. Whereas walking a distance of several blocks would precipitate an attack, now he could walk for a distance of sixteen or more blocks and only feel a sensation of pressure in the chest. Since coming to Florida, it has not been necessary to resort to the use of amyl nitrite or nitro-glycerine. He has not gained in weight but has gained considerable strength. His sleep which was light due to a mental apprehension, is now very sound and restful.

In evaluating the results of x-ray therapy in angina pectoris, we must make due allowance to the role which a semi-tropical climate plays in non-degenerative cardiac diseases. However, I cannot but feel that in uncomplicated cases of angina pectoris, roentgen rays will bring about through their analgesic action, a diminution in the number and severity of the anginal attacks, enabling these patients to face life with more courage and less apprehension.

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SURGICAL CONSCIENCE

In the July issue of this Journal we published on our editorial pages a bit of advise to the young surgeon by that Master Surgeon, Dr. Rudolph Matas. If, for any reason, you failed to read the two editorials appearing in that issue, do so at once. They will convince you that the real surgeon is an idealist, or else he would not choose as his life's work an art so filled with blood and human suffering. Dr. Matas also emphasizes that conscience, after all, is the true measure of a surgeon. A man may be ever so skillful in removing appendices, gall-bladders, and resecting stomachs, yet unless he possesses this surgical conscience, it is much better that he confine himself to some other work.

Listen for a moment. Listen to the closing paragraphs of a speech made by another great surgeon, Faure of Paris, France, in the presence of Their Majesties, the King and Queen of the Belgians. Perhaps as these forceful words thunder through our brains we may gain yet another conception of the meaning of "Surgical Conscience."

"Soon it will be half a century that I have lived in the hospitals. For forty years I have breathed each day in a sort of spiritual communion, with the sick and those operated upon, with those who suffer to live and those who suffer to die.

"When I see them ranged before me, in the evening of my memories, it is a people in a confused tumult which rises in my memory and whose vision fills me with pride and melancholy at the same time.

"Poor lost sick children, defenseless and without understanding! Old men whom inexorable death already grasps! Young women condemned by the unjust travail of maternity! What pains, what miseries, what unjust sufferings, how many innocent victims of a pitiless fate!

"And now we are in the days when we see the last years coming, when we feel the hour approaching to lay down, in our turn, the arms which we have used for so long to drive back death.

"Let us cast a glance backward into the mist of the past, so that our life work may unroll before our eyes. How many dead, how many dead! Their image now dim, now bright, alas, draws itself up before us. Many of them would perhaps still be living on this earth, if our judgment, instead of letting itself be guided by hope, had abandoned them to fate, and had refused to lead them to the table of blood, which for them was the altar of sacrifice, when for so many others it is the threshold of resurrection.

"May our souls remain serene and our hearts firm before the image of these dead. For our souls were pure and our hearts sincere when we placed on them the predestined hands which sought for health and found only death.

"Innocent victims of the Fate which hovers over the world, these dead, these poor dead, have not died in vain. Just as much as the soldiers fallen in battle, they are the obscure artisans of the victory, and their unrecognized sacrifice finds its recompense in the health and joy of those saved.

"How many dead! How many dead! How many living too. . . . It is a whole people that rises. It is a whole world of living people who are giving, and will continue to give, life to others.

"And there is that stronger, more intimate and deeper joy, for those who, in the meditations of their nights, or in the feverish inspiration of some moving moment have forged some new and decisive weapon against suffering and death. This will survive them and will prolong into the future their beneficent activity and will make the work of their brains a living thing, when their fame shall have disappeared and their name shall be stricken from the memory of men.

"Gather together, gather together then, ye phantoms who have disappeared, yet who are living at the present moment, ye children of the future who people our spirits with your shadows

and images; ye are the faithful companions of our memories and of our dreams, ye are our despair, our pride, and our hope!

"Forgive us, ye dead of the past, fallen on the field of honor. Ye are fallen in the hard battle which we fought to preserve life. Console us, countless multitude of the living, multitude of those whom we have saved, who very often appreciate us no longer. Console us, children of the future; although ye will not appreciate it, we gave life back to those who will give it to you. Gather together, dead and living. Let your silent images rise before us. And before the silent throng of all those who owe and will owe their lives to us, as well as those whom we have hastened into death, let the voice of our conscience mount into the silence and come to murmur to the echoes of our souls that the work of our lives has not been in vain, that we will have passed over the earth like the plowman who fertilizes the plain, scattering to the four winds of heaven the seed of future harvests."

MEDICAL CARE

Since the preliminary reports on various forms of activity by the Committee on Cost of Medical Care began to appear some three years ago, many individuals and also groups of individuals, medical, pseudo-medical and purely commercial, began to advance ideas about, and to offer various types of, insurance to help the policyholder meet drug, hospital and physicians' bills. Most of these plans were available to those earning a limited amount monthly while other plans would insure anyone, irrespective of the income, be it large or small. The chief trouble with the plans for those of limited income is the dislike on the part of the individual to reveal all his resources. Most of us at heart are tax dodgers! The wide open plans are almost without exception commercial; that is, a physician is hired at a ridiculously low salary and the promoters pocket a fat dividend.

The College of Surgeons now comes forward and proposes four groups for which more medical care should be available. (See page 70.) They are: 1, the indigent; 2, the uneducated and credulous; 3, those with limited resources; 4, those in remote communities. Somehow the College will study these groups and devise in cooperation with other agencies, some "periodic payment plan", free from the interest of commercial and intermediary organizations. With interest we await the report of their completed studies. However, the preliminary report was positive regarding one group, that is No. 1, the indigent; they should be a direct obligation of their own community and the physicians should receive remuneration. Several times in this column, we have advocated that very thing. The local County Medical Society could set a fee bill to cover this class of individuals. It might be nominal only, but there should be some remuneration for the time spent, the operations performed and the advice given. In all lines, save that of the practice of medicine, nothing is given away. No one ever heard of a life insurance agent giving away his premium, nor an automobile dealer a car, nor a merchant his goods. No more should we throw away our stock in trade.

Group 2 holds many of those who can well afford a physician and do employ one, usually patronizing those who make the greatest play to the galleries or the ones who charge the most. 'Tis a curious idea, we so often hold, that a free article has less real value than an expensive one; that is, advice given free by the most eminent physician will be heeded less than that of a high charging local man. To help the deserving in this class, the Board of Health, through its many workers, its program of preventative medicine, its syndicated articles, its radio broadcasts by eminent men and medical societies, is furnishing a vast amount of material for lay education. We feel a line is gradually being drawn between men of the profession and the many irregulars.

Group 3 need cause us little worry; all that is needed is for each family to adopt a family physician. He, knowing the needs and the resources, would be charitable in dealing with them. It is in this group that the greatest need is expressed. The conflicts of life are so demanding that few even could deduct enough from their salary to carry a policy for hospital attention without severely handicapping many, if not all of the members of the family. And unless all who could not meet their entire hospital charges came in, the insurance group plan would fail, for there must of necessity more be paid into the treasury than is withdrawn.

For group 4, the county might obtain the services of a physician paying him enough above his collections to make his income a livable one; or have a full time county physician, whose duty would be to ride into the sparsely settled regions, somewhat like the circuit rider of a past genera-

tion—an emissary of health, however, instead of one of salvation.

Whatever Utopian scheme is finally brought into being as a result of long and repeated agitation, we feel that the one of cooperative insurance for the so-called middle class—usually well sprinkled with ne'er do wells, who pose and never pay—dooms the plan to the scrap heap.

REPORT OF MEDICAL SERVICE BOARD OF THE AMERICAN COLLEGE OF SURGEONS, JUNE 10, 1934

The Medical Service Board of the American College of Surgeons respectfully submits the following report to the Board of Regents:

1. The American College of Surgeons affirms its interest and its desire to cooperate with other agencies looking toward the provision of more adequate medical service to the whole community.

2. The College believes that it is the duty of the medical profession to assume leadership in this movement and to take control of all measures directed to this end.

3. Encouragement should be given to the trial of new methods of practice designed to meet these needs, and a careful evaluation of their success should be the duty of the medical profession before they are offered for general adoption. All such new and experimental methods of practice must be conducted strictly in accordance with the accepted code of ethics of the medical profession in order that the interests of the patient and of the community may be protected.

4. The College recognizes for immediate study four groups of the population for whom more adequate medical service should be made available, as follows:

a. The indigent.
b. The uneducated and credulous members of the community.
c. Those who because of limited resources are unable, unaided, to meet the costs of serious illness and hospitalization.
d. Those living in remote districts where adequate medical service is not obtainable.

5. The care of the indigent sick should be a direct obligation upon the community and, (unless othewise compensated by intangible benefits such as staff and teaching appointments, opportunity and experience) physicians fulfilling this public service should receive remuneration.

6. The College should work in cooperation with other medical groups in order to dispel the ignorance and credulity of the public, and to bring the people to a proper realization of the protective and curative resources of modern medicine.

7. The American College of Surgeons recognizes that the periodic pre-payment plan providing for the costs of medical care of illness and injury of individuals and of families of moderate means offers a reasonable expectation of providing them with more effective methods of securing adequate medical service.

A number of different plans for the organization of such services have been proposed, although few have been in operation long enough to permit definite conclusions in regard to their success. It is to be desired that these experiments be continued. Conditions differ to such a degree in different parts of the country that a specific plan which is practicable in one place may require modification of details in other communities. The varying restrictions imposed by present insurance laws in different states further complicate the problem.

Periodic pre-payment plans providing for the costs of medical service may be divided into two classes:

A. Payment for medical service.
B. Payment for hospitalization.

It is suggested that plans for the payment of hospitalization alone (Class B) without provision for payment for medical service, may be considered the first project to be undertaken in the average community.

The American College of Surgeons believes that certain general principles can and should be established, the observance of which will tend to obviate known difficulties and dangers which may threaten the success of these special forms of medical service. These principles are as follows:

a. Periodic pre-payment plans for medical service should be free from the intervention of commercial intermediary organizations operating for profit. After deduction of the clerical costs of operation of the fund and such accumulation of reserve as may be advisable in the interest of the contributors or may be legally imposed, the full amount paid by the contributors should be available for medical and hospital services.
b. In the interest of the patient, the organization of plans for the periodic payment of medical and hospital costs must be under

the control of the medical profession. The medical profession must act in concert with the hospitals and such other allied services as may be involved in the individual project, together with a group of citizens representative of the whole community and of industry who are interested in the successful operation of the plan.

c. The principle of free choice of the physician and hospital by the patient must be assured to the end that the responsibility of the individual physician to the individual patient shall always be maintained. When hospitalization is required, this choice must of necessity be limited to the physicians and surgeons who hold appointments on the staffs of the hospitals participating in the plan or to those physicians and surgeons who are acceptable to the hospital. It is further recommended that only approved hospitals be admitted to participation in such a plan.

d. The compensation of the physician and of the hospital should be estimated with due regard to the resources available in the periodic pay. ent fund and should be based upon the specific services rendered.

e. The organization and operation of any plan of this type must be free from any features not in accordance with the code of ethics of the medical profession which code has been established for the protection of the patient.

f. The medical organizations participating in such a plan must assume the responsibility for the quality of service rendered.

8. Periodic pre-payment plans for medical and hospital service should eliminate many of the conditions which have brought about the development of industrial contract practice. Until such plans have been more widely established certain general principles are here formulated with a view to the elimination of the commercial features of such forms of medical service.

a. The Minimum Standard for Industrial Medicine and Traumatic Surgery of the American College of Surgeons should be accepted. This Standard is as follows:

MINIMUM STANDARD FOR INDUSTRIAL MEDICINE AND TRAUMATIC SURGERY

1. That the industry shall have an organized medical department, or service, with competent medical staff including consultants and adequate emergency dispensary and hospital facilities and personnel to assure efficient care of the ill and injured.

2. That membership on the medical staff shall be restricted to physicians and surgeons who are: (a) graduates of scientific medicine holding the degree of Doctor of Medicine, in good standing and licensed to practice in their respective states or provinces; (b) competent in the field of industrial medicine and traumatic surgery; (c) worthy in character and in matters of professional ethics, that in the latter connection, the practice of the division of fees under any guise whatsoever be prohibited.

3. That there shall be a system of accurate and complete records filed in an accessible manner—a complete record being one which includes identification data; cause of illness or injury; nature and extent of illness or injury; detailed description of physical findings; special examinations such as consultations, clinical laboratory and x-ray; tentative or provisional diagnosis; treatment; prognosis with estimated period of disability; progress of illness or injury; final diagnosis; condition on discharge; end results; and such additional information as may be required by statute for Workmen's Compensation claims or for other purposes.

4. That all patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.

5. That the medical department shall have general supervision over the sanitation of the plant and the health of all employees.

b. Physicians and surgeons, qualified as in paragraph 2 of the above Minimum Standard may properly be employed on a full-time or a part-time basis by industrial organizations to provide medical and surgical service for their employees, as follows:

i. To provide emergency service and first aid in injury or disease, and to provide adequate medical or surgical care for industrial injuries and diseases. Medical and surgical care of the families of employees, and of employees themselves, except for emergency and industrial injuries and diseases, should be provided by the industrial physician only in remote districts where other adequate medical service is not available.

ii. To provide pre-employment and periodic physical examinations.

iii. To study the hazards of the particular industry and to cooperate with other agencies in effecting such measures as may be needed for the prevention of injury and disease.

iv. To keep accurate records such as may be required by local Workmen's Compensation laws, and so complete as to serve for scientific investigation of industrial hazards with a view to their further prevention. These records are privileged communications, subject always to due process of law.

c. The sale of a contract by an industrial organization to an individual physician or group of physicians for medical and/or hospital service for its employees encourages commercial competition and is to be condemned.

d. Unethical practices in publicity, advertising, solicitation, and competition, either of a professional or of a financial nature, must be eliminated.

e. The accepted code of ethics of the medical profession, which is designed to protect the best interests of the patient, should apply to industrial medical service as to all other forms of medical practice.

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REPORTS OF DELEGATES TO HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION

Dr. Meredith Mallory, Orlando:

As a delegate from the Florida Medical Association to the recent meeting of the American Medical Association I would like to report my impressions at least. The work transacted by the House of Delegates will be given better and in more detail than I can possibly give; however, there are some things that I would like to call to your attention.

1. The Florida Medical Association should send active delegates that make it their business to be present and they should not be changed from year to year if their work is satisfactory, but should remain as delegates from other states do, year after year, so that the Association may derive the benefit of their contacts. I make that statement from the fact that when my credentials were handed in there was quite some surprise evidenced that Florida was represented by two delegates. Also Florida received no recognition in the way of committee appointments due, I feel, to lack of activity of our delegates in recent years. Some method of defraying at least part of the expenses to the meeting should be devised. Other State organizations do that and some send also their secretaries in order that proper contact can be kept with the affairs of the American Medical Association.

2. In regard to having the A. M. A. convention in Florida I feel it could be had, provided that facilities could be furnished. It would have to be held in Miami but unless there is some building there that could house the scientific and commercial exhibits it would be useless to ever send out an invitation. I understand that Miami has no such place at the present time and unless there are prospects of one being built we had better forget all about such a meeting. However, if there is any chance that this could be arranged it would be a big boost to the Florida Medical Association besides being a great benefit to the State as a whole.

Dr. F. Clifton Moor, Tallahassee:

Your delegate submits the following report of the Cleveland meeting of the A. M. A. House of Delegates:

The details of the proceedings can be readily obtained from the official minutes already published in the Journal, but it is perhaps worth while to call attention to the exceptional number of resolutions submitted, most of which were in connection with some phase of the medical economic situation. It is also of interest to report that the overwhelming sentiment of the House of Delegates was opposed to any form of socialized or state medicine, unless the service was under the complete control of the profession. The principle back of all decisions was that it would be against the best interests of the public and the profession alike, for any organization,

private or governmental, to act as middleman between doctor and patient, and especially if this intervening organization interfered in any way with the free choice of patients in seeking medical advice, or profited directly or indirectly from fees paid for professional services.

Another decision of general interest was the action to table all resolutions endorsing the popularization of birth control measures. The sentiment back of this action was determined more by expediency than scientific facts. In view of the varying personal and religious views on the subject it was thought best to avoid official sanction by the A. M. A., leaving the matter to the discretion of the individual physician, since in its practical application, the individual opinion would, in any case, be the determining factor.

Both of your delegates are convinced that our State Association should adopt the policy of sending the same delegates to the A. M. A. for several consecutive years. We were impressed by the fact that, unless advantage is taken of repeated personal contacts, our State will not get its fair share of committee assignments or other worth while recognition.

RADIO BROADCAST, 1932-33

The following broadcast was arranged by the Public Relations Committee of the Florida Medical Association and given over station WRUF, Gainesville:

THE IMMUNE DEFENSES OF THE BODY*

L. Y. Dyrenforth, M.D.
Jacksonville

The word *immunity* refers to the presence in the human body of agents which operate against the invasion of diseases. It means also that these agents are of more than one kind, each suited to resisting a particular disease. Just as in modern warfare we have a special kind of artillery for combating attacks from the air, and as we have in ancient times built walls and moats around our homes, so in fact has the body developed an intricate mechanism within itself to resist the process we call *disease*. This defensive power, this mechanism of resistance in warding off disease, or delaying its invasion, or weakening its effects, we know as *immunity*.

In times past this conception amounted to mere speculation, principally being concerned with the effects of so-called "curses" or "spells," or with the influence of the planets, the workings of bad air, and what-not.

Today our ideas of the nature and causes of disease are due to the knowledge gained from finding and appreciating the changes which occur in diseased bodies and tissues, and also, demonstrating by laboratory methods the actual existence of living agents (or bacteria) which produce diseases. These aids to modern medical knowledge are named *Morbid Anatomy* and *Histopathology*, and *Bacteriology*. In our own generation, in addition, the experimental method has added greatly to a well-ordered understanding of the facts concerned with the workings of disease. An example of the trend of scientific medicine is to be seen in that what were known to our grandparents as "fevers" are now classified as specific infectious diseases, because a definitely known causative agent can be ascribed in each instance.

For a concise and descriptive grouping of diseases, the classification which is based upon *causation*, and originating with the medical department of the United States Army, is helpful. The causative agents in order of frequency are classed as *Animate, Inanimate, Unknown*. In the *Animate* group these agents are bacteria, viruses, worms, malarial parasites, and so on, which produce *infections*. The type of defense in this case is immunity, or natural resistance.

In the *Inanimate* group these causative agents are physical forces (causing injuries), and chemical forces (causing intoxications, addictions, and conditions arising from lack of vitamines). The type of defense here is tolerance and habituation.

In the *Unknown* group we have the not-well-understood causative agents, which produce diseases of metabolism and of constitution. The type of defense in this group is not understood. Why some individuals are peculiarly susceptible to disorders of the endocrine system, for instance, and others are not, remains for a future generation to reveal.

As to these three very general classes of diseases and their causative factors, only the first, or animate group, can be discussed in such a treatment as this. This group is concerned with about half the diseases of mankind. It would be pertinent to include here, if time permitted, the several disease processes resulting from foreign proteins such as asthma, hayfever, and urticaria.

*Broadcast delivered under auspices of Florida Medical Association over Station WRUF, Gainesville, April 30, 1933.

To begin with, these *animate sources* of disease are many and varied. Those which are well known are ordinary bacteria, such as are responsible for common infections like typhoid fever and tuberculosis, the worms which infest the intestinal tract, the spirochetes of syphilis, the fungus growths of athlete's foot, and the parasites of malaria. Those which are not so well known are the organisms which as yet are invisible to our methods of search, and which are called *filtrable viruses* by reason of the fact that they, or their disease-producing products, can pass through the finest of filtering media. These latter include hydrophobia (or rabies), and poliomyelitis (or infantile paralysis).

An important consideration in resistance is the physical barrier of normal healthy skin. This is a digression, however, from the conception of immunity discussed here, and is only mentioned in passing.

The types of resistance usually considered are: (1) Natural Immunity and (2) Acquired Immunity. Natural Immunity is an inborn affair and ordinarily is of theoretical interest only. Examples of this type are the inherent, or natural, resistance of most animals to leprosy, of most animals to pneumonia; and further, we do not see such diseases as typhoid fever, measles, or scarlet fever occurring spontaneously in lower animals; nor do the warm-blooded animals fall heir to the infections peculiar to those of the cold-blooded group. A side-issue of natural immunity is to be seen in *racial immunity*, of which there are several familiar instances. The white race is less susceptible to tuberculosis than the black race, the former having developed this natural immunity through centuries of intimate contact, a condition which has been denied races of recent savage origin, and as a result these are fertile, defenseless breeding grounds for the bacillus of tuberculosis. For similar reasons the aboriginal races are not so apt to acquire malaria or hay-fever, being on more familiar terms, as it were, with the factors causing these scourges of civilization.

Our public health measures are more concerned with this second type of resistance mechanism, acquired immunity, which is of two kinds, active and passive. This acquired immunity may be either artificially or naturally imposed upon us. For a period of months after birth the normal breast-fed infant is practically immune to diphtheria and many other diseases because these factors of resistance have been bestowed through its mother's blood stream. Another form of naturally acquired immunity is having a disease such as scarlet fever, and recovering from it. This establishes immune forces which thereafter exist in some degree or other.

Although this is very important, it is much more important to understand the mechanism of the artificially imposed kind of acquired immunity, for which we are indebted to our established health organizations.

As has been stated, the two kinds of artificially acquired immunity are the active and the passive. To define these briefly, active acquired immunity is that which is conferred by injecting into the system either bacteria or preparations made from bacteria. These may be the living germs themselves, or the germs after killing them by heating, or extracts made from the germs. In each case, however, the germ or germ products used are those which are concerned with the particular disease in question.

Bacteria, like other living matter, contain proteins. Each kind of germ exhibits its own particular protein, so that when injected into another living organism, such as the human, there is immediately built up an antagonistic substance within this injected individual. This substance, the actual nature of which is purely hypothetical, is called an antibody; the injected protein substance which excites such formation is called an antigen. When thus formed, antibodies perform their duties in several ways. For instance, if they are called upon (as in diphtheria) to neutralize toxins, they act as antitoxins; if they destroy living germs, they are known as bacteriolysins. These powerful antagonistic bodies may remain potent for months—even years—and so confer a more or less enduring immunity. Thus, when a person is immunized by injections of dead typhoid bacteria, as during the World War, he may be exposed without danger to conditions which ordinarily would have meant sure infection with the disease. This, then, is active immunity. Smallpox vaccination is another example of acquired immunity, in which the vaccinated person is protected by being given a modified form of the disease.

Passive immunity is that which is conferred by taking the serum, or liquid part of the blood, from a person or animal who has had active immunization, and injecting it into another individual who is to be immunized. The reason this is called pas-

sive immunity is that this last individual is not concerned in the production of such immunity in the same way as the actively immunized individual, whose body cells actually produced the antibodies which made his serum capable of performing such immunity. It is this kind of "transferred" immunity with which we are most familiar in daily life.

In this way those immune sera, diptheria antitoxin and toxin-antitoxin, are made from horses' blood. Selected animals are treated with the toxin of the disease, and after a period in which antagonistic forces or antibodies, are developed, some of the horse blood is taken from a vein, and upon separating from it the red blood corpuscles and purifying it this serum then becomes "diphtheria antitoxin." The horses do not suffer ill effects from the treatment and are willing volunteers over a period of years to this important phase of public health endeavor. What is known as "toxin-antitoxin" is diphtheria toxin neutralized with anti-toxin, a procedure which curbs the effects of the "straight" toxin without detracting from its immunizing abilities. In recent times, another immunizing material called toxoid has been introduced and may largely replace toxin-antitoxin in immunization against diphtheria. The purpose of toxin-antitoxin is prevention; the purpose of antitoxin is to aid the body in curing the disease, once it has become established.

A word about early conceptions of immunity. Robert Koch, the pioneer bacteriologist of fifty years ago, thought it due to some variation in the condition of the blood, without knowing what this condition was. Fodor considered that certain antiseptic substances were acquired by the blood under circumstances of immunization. Pasteur's "exhaustion theory" held that resistance to disease following recovery was due to the fact that the first invasion used up nutritive substances which left succeeding invaders without anything to live on — a condition somewhat similar to growing several successive crops on unfertilized soil. Metchnikoff finally grasped the situation and pointed the way toward clarifying it. Briefly, he showed that the leucokytes, or white blood cells, are endowed with powers for destroying invading microorganisms by engulfing and absorbing them. Bordet and Ehrlich were later instrumental in establishing that specific substances are built up, not only in the white blood cells, but in the red cells and in other cells elsewhere, when a disease process invades the system. Finally, then, the substance elaborated by cells so influenced is the instrument which in the body fluids acts directly upon the disease-producing elements.

In conclusion it is to be seen that the study of immunity is but one cog in the intricate mechanism of modern medical science. It is so closely linked with environment and heredity that it is not capable of being worked out in the laboratory alone. The family doctor, the public health official, and the laboratory worker are together concerned with the problem, and their fields converge in approaching its solution. Dr. Walter B. Jones sums up the matter significantly by stating: "We cannot think of life as an isolated fact, but only as a complex, the result of a large number or coordinated facts which should be in harmony with one another, but which unfortunately often are in disharmony. Health and disease too are not isolated facts, and it is to be desired that physicians, whose aim it is to promote health and to combat disease, should realize that man and his diseases should be viewed as parts of a complex in which the environment, both physical and mental, plays an important role, and that one should not be neglected by him, in practice, in teaching, and in research."

STATE NEWS ITEMS

The many friends of Dr. Crowell W. Johnston of Jacksonville will be glad to learn that he has recovered from a recent appendicitis operation.

* * *

Dr. F. W. Chappell of Hastings announces his removal to Madison. Dr. Chappell will operate the Yates Sanatorium in that city.

* * *

Dr. and Mrs. S. B. Forbes of Tampa recently spent two weeks in Denver where Dr. Forbes took a post-graduate course in ophthalmology and otolaryngology.

* * *

Drs. E. Clay Shaw and B. L. Whitten of Miami are at present on a travel tour in South America.

* * *

Dr. L. A. Hodsdon of Miami has returned from Nassau and the Windward Islands. He explored caves at Gambier Lake, Port Howe, Macqueens and the Bight. Cave bats, soldier crabs, tree toads, poisonous spiders and a few mollusks were taken for the University of Miami.

Dr. S. E. Driskell of Jacksonville was elected president of the State Board of Medical Examiners at their semi-annual meeting held in Jacksonville, June 13 and 14, 1934.

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Dr. Courtland D. Whitaker, formerly of Raiford, announces the opening of offices in the Dekle Building, Marianna.

* * *

Dr. J. A. Redfearn and family of Albany, Georgia, spent a few days recently in Jacksonville as the guests of Dr. and Mrs. T. H. D. Griffitts. Dr. Redfearn was very active in the malaria control program during the time he was chairman of the Health Committee of the Kiwanis Club and was voted the Governor Hardman Award by the Georgia Medical Society for outstanding contribution to the public health program of that state.

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Dr. W. H. Spiers of Orlando, who has been in Pittsburg as an expert witness in psychiatry in a court case, has journeyed to Chicago where he will attend a post-graduate psychiatric clinic. Incidentally, he will visit the Fair.

* * *

Dr. and Mrs. Fuad H. Hanna of Miami announce the birth of a son, Stanley George, on June 15th.

* * *

Among those in attendance at the meeting of the Chattahoochee Valley Medical and Surgical Association, held at Radium Springs, July 10 and 11, were the following Florida doctors: M. Jay Flipse and M. C. Wilson, Miami; Frank D. Gray and C. D. Christ, Orlando; T. Z. Cason, Julian Gammon, Gerry Holden, Edward Jelks, W. M. Shaw, J. Knox Simpson and H. Marshall Taylor of Jacksonville.

* * *

Dr. John S. Helms, Jr., of Tampa is spending several weeks in Rochester, Minn., where he is attending clinics in surgery at the Mayo Clinic.

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The many friends of Dr. E. W. Warren of Palatka will be pleased to learn that his youngest son, Walter, was nominated a candidate for the House of Representatives in the next Legislature. Mr. Warren, who is 21 years of age, recently finished a law course.

Dr. Jack Halton of Tampa has returned from a three weeks' visit in Cincinnati. While in that city Dr. Halton did work in proctology at the Cincinnati University Hospital, Christ's Hospital, the Good Samaritan Hospital and the Jewish Hospital.

* * *

Dr. N. P. Myers, formerly of Parrish, has moved to Holopaw, where he has opened offices.

* * *

Dr. Shaler Richardson of Jacksonville, secretary of the Association, has returned from a two weeks' trip to Canada and New York where he attended medical meetings.

* * *

Dr. H. L. Brillhart of Jacksonville has returned from Baltimore, Md., where he attended clinics.

* * *

The following members of the Florida Medical Association registered at the convention of the American Medical Association held in Cleveland, Ohio, June 11-15:

L. E. Bransford, Jacksonville.
B. A. Chapman, Jacksonville.
L. W. Cunningham, Jacksonville.
W. M. Davis, St. Petersburg.
J. C. Dickinson, Tampa.
O. O. Feaster, St. Petersburg.
Jack Halton, Tampa.
E. M. Hendricks, Ft. Lauderdale.
John A. Herring, St. Petersburg.
W. T. Hotchkiss, Miami.
W. J. Johnston, Sarasota.
Walter C. Jones, Miami.
David R. Kennedy, Sarasota.
Roscoe H. Knowlton, St. Petersburg.
E. J. Lawrence, Winter Garden.
H. B. McEuen, Jacksonville.
Meredith Mallory, Orlando.
Eugene B. Maxwell, Miami Beach.
Frank C. Metzger, Tampa.
Edith P. Mols, Tallahassee.
F. Clifton Moor, Tallahassee.
T. Earl Moore, Miami.
Frank R. Morrow, Miami.
Rosalie S. Morton, Winter Park.
E. Sterling Nichol, Miami.
S. R. Norris, Jacksonville.
Richard C. Norton, Miami Springs.
Cayetano Panettiere, Miami Beach.
H. J. Peavy, Ft. Lauderdale.
Warren Quillian, Coral Gables.

Gerard Raap, Miami.
Marvin Smith, Miami.
Robert T. Spicer, Miami.
Alvord L. Stone, Tampa.
H. Marshall Taylor, Jacksonville.
Iva C. Youmans, Miami.

* * *

The Gynecean Hospital Institute of Gynecologic Research of the University of Pennsylvania, is conducting an intensive study of families into which congenitally malformed individuals have been born.

Special interest centers in families in which malformations have appeared in two or more children. Physicians who have knowledge of any such families are urged to communicate with:

Dr. Douglas P. Murphy,
Gynecean Hospital Institute,
University of Pennsylvania,
Philadelphia, Pa.

* * *

Dr. W. M. Rowlett, Secretary of the State Board of Medical Examiners, reports that of the seventy-three applicants who took the examination in Jacksonville, June 11th and 12th, there were sixty-six that passed the examination and were issued licenses. There were seven failures. The applications of twenty-nine physicians were turned down by the Board. Of these, twenty-four were foreigners and five were graduates of low grade American colleges, whose diplomas are not accepted by the Board. Five of the applicants are natives of Florida. Dr. George F. Wilkins, of the Riverside Hospital, Jacksonville, a graduate of Harvard Medical School, 1932, led the class with an average of 92.5%. Dr. Virgil M. Bradshaw, of the Tampa Municipal Hospital, who took his pre-medical work at the University of Florida, and graduated from Rush Medical College in 1933, was second high with an average of 91.9%.

Licenses have been issued to the following successful applicants:

Baldwin, Donald M., Jacksonville.
Ball, Elmer J., Manitowoc, Wisconsin.
Bartleson, Fred D., Ft. Myers.
Batten, Glenn D., Yuma, Tenn.
Bieker, Arthur J., Tampa.
Bond, Benjamin J., Savannah, Ga.
Bosworth, Joe M., Jr., Atlanta, Ga.
Bowen, Louis R., Tifton, Ga.
Bradshaw, Virgil M., San Antonio.
Bramlitt, Charles H., St. Petersburg.
Bratley, Forrest G., Miami.
Broadbent, Mary, Elwood, Ind.
Calvert, Read N., Orlando.
Charlton, H. R., Bronxville, N. Y.
Click, Gustavo N., Pensacola.
Dowlen, Otto S., Lynnville, Tenn.
Drennen, W. Earle, Birmingham, Ala.
Elliott, Charles A., Chicago, Ill.
Erwin, A. L., Nashville, Tenn.
Feld, Nathan, Richmond Hill, N. Y.
Gardner, Herbert D., Coconut Grove.
Girvin, Howard W., Chattahoochee.
Griffin, Taylor W., Quincy.
Guinand, P. H., Tampa.
Hall, Young L., Jr., Adel, Ga.
Hallum, Alton V., Atlanta, Ga.
Hasty, Frederick E., Nashville, Tenn.
Hewlett, Frank W., Coral Gables.
Hofling, Charles A., Jr., Cincinnati, Ohio.
Hogan, Cecil M., Hialeah.
Ingram, Hollis C., Orlando.
Jenkins, O. W., Chattahoochee.
Kay, Milton B., Miami.
King, Raymond H., Jacksonville.
Leu, Raymond H., New Martinsville, W. Va.
Macdonald, John T., Norristown, Pa.
McCauley, Everett W., Tampa.
McKenzie, Jack A., Miami.
Mikell, Robert F., DeLand.
Mitchell, William S., Atlanta, Ga.
Moon, P. L., Jr., Atlanta, Ga.
Murphree, Walter E., Tallahassee.
Murray, O. B., Rossville, Ga.
Park, Manasseh B., Ridgewood, N. J.
Peacock, William F., Vidalia, Ga.
Putnam, James H., Alabama City, Ala.
Rice, William P., Pensacola.
Ricker, Samuel F., Orlando.
Roth, Edward, Brooklyn, N. Y.
Scott, Douglas G., Altamonte Springs.
Shepard, Richard C., Opelika, Ala.
Stem, Leon T., Chattanooga, Tenn.
Stephenson, Gordon A., Buffalo, N. Y.
Stoner, Cyrus H., Attapulgus, Ga.
Thompson, Cornelius M., Jacksonville.
Thomson, W. R., Miami.
Timberlake, Gideon B., Stevenson, Ala.
Travers, Milton P., Miami.
Vallotton, Joseph R., Valdosta, Ga.
Wakefield, Harry A., Charlotte, N. C.
Walker, Henry M., Nashville, Tenn.
Watson, Samuel E., Lakeland.

Wells, William C., Cave City, Ky.
Wilkins, George F., Jacksonville.
Wochinski, Aloysius J., Chicago, Ill.
Wynn, Robert S., Jacksonville.

* * *

Dr. L. W. Holloway of Jacksonville has returned from Saluda, N. C., where on July 24 and 25 he delivered lectures at the Southern Pediatric Seminar on "Premature Infants" and "Vomiting in Infants and Children."

COMPONENT COUNTY SOCIETIES

DADE COUNTY MEDICAL SOCIETY

At the meeting of the Dade County Medical Society, held August 3, at the Huntington Club Rooms, Miami, the following program was presented:

"Skin Tumors"—Charles D. Cleghorn, Miami.
"Gritti-Stokes Amputation for Gangrene of the Leg"—J. W. Snyder, Miami.

LEON-GADSDEN-LIBERTY-WAKULLA-JEFFERSON COUNTY MEDICAL SOCIETY.

The quarterly meeting of the Leon-Gadsden-Liberty-Wakulla-Jefferson County Medical Society was held at the Elks Club, Tallahassee, July 19th, at 3:00 p. m. The following scientific program was presented:

"Report on Three Cases of Malaria with Hemoglobinuria"—B. F. Barnes, Chattahoochee.
Discussion: M. F. Boyd and Marion Salley, Tallahassee.
"Causalgia"—R. F. Godard, Quincy.
Discussion: W. W. Massey, Quincy, and J. K. Johnston, Tallahassee.
"The Prevention of Puerperal Infection"—L. L. Dozier, Tallahassee.
"A Follow-up Report on a Case of Cirrhosis of the Liver"—John L. Williams, Tallahassee.

THE LEON-GADSDEN-LIBERTY-WAKULLA-JEFFERSON COUNTY MEDICAL SOCIETY HAS JOINED THE EVER-GROWING RANKS OF 100% PAID SOCIETIES. AT THE PRESENT TIME EIGHTEEN SOCIETIES ARE IN THE 100% PAID GROUP.

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